

MODELLING AUCKLAND CITY'S GROWTH

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ACC predicts a population increase in Auckland of 262,000 people between 2006 and 2051. To manage this growth; ACC has formulated a Growth Strategy, which sets out how, when and where population growth will happen. This has included identifying 19 growth nodes, which have been prioritized for intensification..

To identify how the predicted growth will impact on the City's wastewater infrastructure MW and ACC initiated the Growth Planning Study. This study allowed for proactive planning to ensure future demands and levels of service are met.

Population projections were developed at five year intervals out to 2051, according to expected future district plan changes and Statistics NZ forecasts for each individual growth node area. This was translated to imperviousness values and population rates at five year intervals and these were uploaded into existing catchment models.

DHI's MOUSE modelling software was used to identify performance issues and the five year block in which the performance issue was predicted to arise, based on changes to imperviousness and population growth, for 21 catchments in Auckland City. DHI's pipe design tool was used to provide a quick "order of magnitude" solution costing to resolve spilling of the wastewater system with a 50 year capacity design life. The same tool was used to size the required pipe upgrades through iterative model runs to provide indicative estimate of the cost and timing of upgrades to meet levels of service against this profile of City Growth.

A large number of model runs were undertaken to establish when wastewater spills would occur in the a 1 in 1 year design storm, factoring in increased population based flows over time. To achieve an optimal upgrade plan, the system was looked at dynamically as progressive upgrades would alter the system performance and therefore future upgrade requirements. To confirm that the models had produced a realistic set of upgrade requirements, an additional manual checking process was undertaken using a spreadsheet applying Manning's equation.

This paper describes the challenges encountered using a modelling approach to determine the cost of growth for Auckland City. The advantages and the disadvantages of this project are discussed in terms of technical approach and project management.

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